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AN 1995:643215 CAPLUS
DN 123:137520
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TI Type I Benzophenone-Mediated Nucleophilic Reaction of 5'-Amino-2',5'-dideoxyguanosine. A Model System for the Investigation of Photosensitized Formation of DNA-Protein Cross-Links
AU Morin, Benedicte; Cadet, Jean
CS Departement de Recherche Fondamentale sur la Matiere Condensee, SESAM/LAN, Grenoble, F-38054, Fr.
SO Chemical Research in Toxicology (1995), 8(5), 792-9
CODEN: CRTOEC; ISSN: 0893-228X
PB American Chemical Society
DT Journal
LA English
CC 8-2 (Radiation Biochemistry)
AB 5'-Amino-2',5'-dideoxyguanosine has been synthesized to investigate the intramol. reactivity of an amino group toward the guanine radical produced by type I photosensitization mechanism. Benzophenone-mediated photosensitization of 5'-amino-2',5'-dideoxyguanosine in aerated aqueous solution results in the formation of a predominant cyclic nucleoside together with an unstable nucleoside precursor. The two modified nucleosides have been isolated by reverse phase high performance liquid chromatog. and characterized by spectroscopic measurements including 13C and 1H NMR, fast atom bombardment mass spectroscopy, and UV absorption. The stable photoproduct has been identified as 9-oxa-2,4-diazabicyclo[4.2.1]non-2-en-7-ol, 3-amino- (1R-exo), whereas its precursor has been assigned as acetic acid, [(7-hydroxy-9-oxa-2,4-diazabicyclo [4.2.1]non-2-en-3-yl)amino]oxo-(1R-exo). A reaction mechanism, involving nucleophilic addition of the sugar amino group to guanine radical intermediates, is proposed to explain the formation of the two photoproducts.